

**Technology  
for**

# **Alaskan Transportation**

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Alaska Transportation Technology  
Transfer Program

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**"Improving Alaska's quality  
of transportation through  
innovative technology."**



This newsletter is funded by a grant from  
the Federal Highway Administration  
and the Alaska Department of  
Transportation and Public Facilities.

## **Beware of Falling Deflectometer Weights**

The Department of Transportation and Public Facilities (DOT&PF) recently provided a valuable short course on the operation and data analysis of Alaska's falling weight deflectometers (FWD). The course, through contract with Dynatest, Inc., included training and discussion on the theory, operation, troubleshooting, maintenance and calibration of the FWD and the accompanying data collectors.

Each DOT region was encouraged to send two deflectometer operators and an engineer who was familiar with mechanistic pavement design methods to the course led by Dick Stubstead, the president of Dynatest USA. The FWD system, founded and



developed by Stubstead, is considered a state-of-the-art highway design system and used across the United States and in many foreign countries. The State of Alaska currently owns four deflectometers that are operated by regional materials and maintenance staff.

The main goal of the course was to  
(continued on page 3)

## **Cold Weather Starting**

The most widely accepted practice for starting a diesel engine in cold weather is to preheat the coolant that is contained in the engine block.

There are several devices on the market that will accomplish this task, but the most popular is the direct immersion heater. This style of heater is the most efficient since it becomes part of the engine with the heating element completely immersed in coolant. All of the heat produced by the heater goes directly into the engine so heat loss is minimal compared to externally mounted styles.

Due to the differences in engine design, immersion style heaters are

custom-designed for each engine and will only mount in a specific place. There is a variable with all immersion heaters and that is the wattage rating. Wattages can range from 750 for mid-range diesels to 2,000 watts or even higher for larger engines. When choosing the units for a fleet, one should be aware that there is a correlation between the amount of wattage required when compared to the coldest average temperature the vehicle will encounter. The following chart demonstrates that interrelationship.

(continued on page 2)

1. The chart shows the approximate wattage of the immersion heater to be used at various ambient temperatures.
2. Temperatures within the block will vary from almost boiling point at the heater to near ambient temperature at the extremities of the block, depending on the size of the heater and the weather conditions.
3. When using external or tank-type heaters, add 50 percent to the above wattages.
4. The maximum temperature rise of the engine will be reached in 5 hours of heater operation.

One of the most frequently asked questions is: "How long should the heater be left on?" Note No. 4 states that the engine will be at maximum temperature attainable after five hours of operation.

Displacement of Block in cu.	Recommended Watts Per Cubic Inch Displacement				
	Various Fahrenheit Temperatures				
	1 Watt/cu. in. @ 0°F	1.5 Watt/cu. in. @ -10°F	2 Watts/cu. in. @ -20°F	2.5 Watts/cu. in. @ -30°F	3 Watts/cu. in. @ -40°F
100	100	150	200	250	300
200	200	300	400	500	600
300	300	450	600	750	900
400	400	600	800	1000	1200
500	500	750	1000	1250	1500
600	600	900	1200	1500	1800
700	700	1050	1400	1700	2100
800	800	1200	1600	2000	2400
900	900	1350	1800	2250	2700
1000	1000	1500	2000	2500	3000

Another recurring question is: "How warm will the engine get?" That one isn't as easy to answer because of the multitude of variables involved, such as air temperature, what wattage heater is being used, the force of the wind and whether or not the vehicle is sheltered. While it may not be possible to predict the highest temperature possible, the lowest heat

rise to expect would be 40 degrees above the outside air temperature, and that would be if everything was working against you.

The use of these devices should be controlled because engine preheaters can be a major energy consumer. For instance, the five-hour maximum heating time could easily be controlled with a circuit timer.

There is also another way. Since it is always easier to maintain a temperature than it is to reach one from a cold start, a thermostat kit (specifically designed for immersion heaters) that allows operators to plug in as soon as they come off the road could be purchased. The preheater is not activated until the engine has cooled down to either 100 degrees or 55 degrees, depending on which model is being used. The engine is warmed an additional 20 degrees at which time the heater is deactivated, allowing the engine to cool down again, repeating the cycle. Not only does this device maintain a higher engine temperature, but it also saves money by lowering energy costs.

*Reprinted from the Kentucky Transportation Center newsletter "The Link, Winter, 1991-92."*

## News & Views

### Authority of State DOT to Mitigate the Environmental Impact of Transportation Projects

State highway departments and transportation agencies have a continuing need to keep abreast of operating practices and legal elements of specific problems in highway law. A report regarding this need has been investigated by James B. McDaniel, Transportation Research Board Counsel for Legal Research, and prepared by Richard A. Christopher.

The paper, entitled "Legal Problems Arising Out of Highway Programs," is primarily concerned with current Federal and State statutory mitigation programs. A portion of the discussion deals with some common issues related to funding and land acquisition. However, it was not the intent of the paper to analyze, in detail, each Federal and State program.

This paper will be published in a future addendum to "Selected Studies in Highway Law." Volumes 1 and 2 of SSHL deal primarily with the law of eminent domain and the planning and regulation of land use. Volume 3 covers government contracts. Volume 4 covers environmental and tort law,



intergovernmental relations and motor carrier law.

Copies of SSHL have been sent, without charge, to NCHRP sponsors, certain other agencies, and selected university and state law libraries. The officials receiving complimentary copies in each state are: the Attorney General and the Chief Counsel and Right-of-Way Director of the highway agency. Beyond this initial distribution, the 4-volume set is for sale through the Transportation Research Board for \$185.

Copies of the "Legal Problems Arising Out of Highway Programs" paper, published in the May, 1992 Legal Research Digest newsletter, are available for loan from the Alaska T2 Program office.

### Questions? Comments!

Drop us a line. We love to hear from our readers.

Alaska T2 Program  
2301 Peger Road  
Fairbanks, AK  
99709-5316



### Beware of Falling Deflectometer Weights (continued from page 1)

allow the operators and engineers to become more familiar with the whole FWD operation and analysis system. Since some of the data from the deflectometer has been analyzed by outside consultants, many FWD operators have collected data without a clear understanding of how the data was analyzed or applied. Conversely, some engineers were analyzing data without a clear understanding of the mechanics of data collection. Because of these deficiencies, it was especially valuable for the operators and engineers to learn about the interpretation of the data they collect.

"We all got a chance to sit down and run analysis programs on the data and learn about the interpretation of the data we collected," said Pat Harmon, an operator and paving materials inspector for DOT&PF's Southeast Region.

A secondary goal of this course was to get the operators and engineers together in order to make each other aware of particular needs and potential problems.

"It was valuable for us to discuss each region's particular pieces of equipment and discuss problems that have occurred over the years and to basically discuss and share notes," Harmon said.

The FWD is a non-destructive test apparatus that was first purchased in

1982 by the Department's Statewide Research section. The device simulates the load imposed on the roadway by a moving truck by dropping weight on the surface with a force of 9,000 pounds. The force can be increased to 27,000 pounds in order to simulate aircraft landing loads.

Information obtained from the



FWD has a number of important applications to DOT&PF. The deflectometer is especially useful in estimating the life of the pavement, detecting problem areas before surface distress appears, both of which allow for advanced construction planning, and accurately determining the overlay thickness based on deflection information.

"Primarily, it is used for designing overlay thicknesses on new asphalt overlays and for reconstruction methods," Harmon said. "Additionally, the FWD data is used to impose or take off load restrictions to protect

highways during the freeze and thaw cycles in the fall and spring."

The data collected from the deflectometer not only relates to pavement conditions but also to the underlying subgrade, making up the road prism. The analysis of the information tells the engineers what vehicle weights the road can support and what is going on in the underlayer that could lead to a reduction in the life of the pavement.

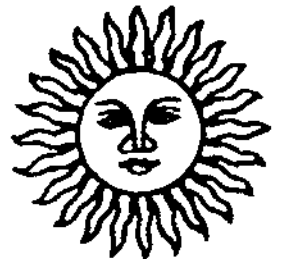
The course was coordinated by the Alaska Transportation Technology Transfer (T2) Program, with funding provided by the National Highway Institute (NHI). The goals of the course were successfully met and exceeded, and those in attendance considered it to be extremely valuable for their work on Alaskan highways. Thanks go out to Dick Stubstead, course instructor and president of Dynatest USA; Sharon McLeod-Everette and Jim Bennett of the T2 Program; and Denny Wohlgenuth of the Northern Region DOT&PF, who hosted the course.

*Dave Sterley, Southeast Region DOT Materials Inspection Coordinator, and Pat Harmon, Southeast Region Operator and Paving Materials Inspector, contributed to this article.*

Ed. Note: T2 thanks Dave Sterley for his efforts in bringing this training to Alaska.

## 28 Secrets to Happiness

- ✧ Live beneath your means and within your seams.
- ✧ Return everything you borrow.
- ✧ Donate blood.
- ✧ Stop blaming other people.
- ✧ Admit it when you make a mistake.
- ✧ Give all the clothes you haven't worn in the last three years to charity.
- ✧ Every day do something nice and try not to get caught.
- ✧ Listen more; talk less.
- ✧ Every day take a 30-minute walk in your neighborhood.
- ✧ Skip two meals a week and give the money to the homeless.
- ✧ Strive for excellence, not perfection.
- ✧ Be on time.
- ✧ Don't make excuses.
- ✧ Don't argue.
- ✧ Get organized.
- ✧ Be kind to kind people.
- ✧ Be even kinder to unkind people.
- ✧ Let someone cut ahead of you in line.
- ✧ Take time to be alone.
- ✧ Reread a favorite book.
- ✧ Cultivate good manners.
- ✧ Be humble.
- ✧ Understand and accept that life isn't always fair.
- ✧ Know when to say something.
- ✧ Know when to keep your mouth shut.
- ✧ Don't criticize anyone for 24 hours.
- ✧ Learn from the past, plan for the future, and live in the present.
- ✧ Don't sweat the small stuff.



*From the Northwest Technology Transfer Center "Bulletin," Spring, 1992.*

The Alaska Transportation Technology Transfer (T2) Program is funded by the Alaska Department of Transportation and Public Facilities (DOT&PF) and the Federal Highway Administration (FHWA).

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- \* TSgt. David Luera, Eielson AFB, alternate

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Alaska Transportation  
Technology Transfer Program  
Department of Transportation  
and Public Facilities  
2301 Peger Road  
Fairbanks, AK 99709-5316  
(907) 451-5320

**"Work smarter, not harder."**



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### Alternatives to Salt, What's Available?

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Agencies that use salt or rock salt for deicing are faced with soaring maintenance costs for their roads and bridges due to corrosion. Industry, in an effort to address these problems, has been developing alternative deicing materials. These deicing materials have been developed to cause fewer problems than salt.

The following is a summary of information on low-corrosion deicers assembled from Oregon DOT and other sources.

**FREEZE GUARD + PCI** is a combination of magnesium chloride (MgCl) and a polymeric corrosion inhibitor (PCI). While the product is less corrosive than salt, and appears to address the problem of corrosion in vehicles, there is no substantial evidence that the inhibitor is effective on imbedded reinforcing steel.

The product has been used as an anti-icer in the Medford area using truck-mounted spray tanks. It needs agitation in the storage tank to keep the inhibitor from separating.

**ETHYLENE GLYCOL** is the present choice for use on concrete structures and pavements. It has been used as an anti-icer in the Medford area using truck-mounted spray tanks. It has also been mixed with sanding material for deicing in the Portland area. Urea has been added for heavy deicing in the Portland area.

Recent studies indicate no environmental problems at the concentrations used for deicing. However, there may be some concern about possible volatile organic compound (VOC) emissions.

**UREA** is a dry organic fertilizer that has been used as an anti-icer at airports. Washington state uses straight urea in certain chloride-free areas. It can also be mixed with sanding material for deicing.

**UCAR** is a liquid mixture of urea and ethylene glycol used primarily for airport deicing. It can be mixed with sanding material. The Portland airport uses a similar mixture in its operations.

**POTASSIUM ACETATE** is a new liquid deicer for use at airports. While expensive, it is effective at lower temperatures than most other deicers. It can be used in the same ways as UCAR or ethylene glycol. It also can be combined with calcium magnesium acetate (CMA) as an activator (10%).

**CALCIUM MAGNESIUM ACETATE (CMA)** is a dry product used in many areas for roadway deicing. It can also be mixed with sanding material for deicing. It can be combined with potassium acetate as an activator at 10 percent.

For more information, contact Dick Parker at the Oregon T2 Center, (503) 378-3421.

*From the Fall '91 issue of the Oregon Roads Newsletter.*

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### Salt Techniques in Alaska

Using salt as a deicer on Alaskan roads is a very slippery topic for the DOT&PF, particularly in the last few years. Critics of salt use say that it rusts out their cars, damages roadside vegetation and is harmful to the quality of water along roads and highways.

But Clark Milne, Director of Maintenance and Operations for the Fairbanks DOT&PF, said that the benefits of using salt far outweigh its potentially harmful effects. Because the DOT&PF is legally liable to keep the roads safe during icy conditions, Milne said the department could be sued if it did not use a deicing tool in conditions that it knows to be unsafe. And the most efficient and cost effective tool available is salt, he said.

Statewide, the DOT&PF uses about 13,000 tons of salt each year. Of that, about 1,000 goes on Interior Alaska roadways. For the city of Fairbanks, the DOT&PF spreads between 25 and 75 tons of salt each winter season. And around 1,000 tons of salt hit the roads in Anchorage each year through a sand/salt mixture.

One of the drawbacks of salt in the interior of the state is that its melting power significantly decreases when the temperature drops below 20 degrees. Since temperatures in the interior often drop below 20 degrees very quickly in the winter season, salt can only be used during temperature "windows." However, these same cold temperatures tend to create very dry roads and increase the coefficient of friction between the ice and tires on a car.

The southern and central areas of the state usually receive a heavier, wetter snowfall and enjoy higher temperatures, both of which lead to longer temperature windows for salt usage to deice the roads.

Currently, Milne is working on a report comparing the use of salt to the nearest feasible alternative, the use of Calcium Magnesium Acetate (CMA). He hopes to complete the report early next year.

*Be sure to watch for a more in-depth look at salt use in Alaska in the Winter issue of the T2 Newsletter.*

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## Alaskan Transportation Technology Transfer Program

### Planning, Design and Field Notes

## Congressionally Mandated Rock Salt Study Completed

A congressionally mandated study to compare the full economics of using rock salt and calcium magnesium acetate (CMA) for highway deicing has been completed for FHWA by the Transportation Research Board (TRB). The researchers for the study evaluated the myriad factors affecting the use of deicers, e.g., deicer cost, costs of corrosion to motor vehicles and infrastructure, and the environmental and health factors. Costs assignable to these factors, with the exception of environmental and health factors, were developed for rock salt. Since CMA is non-polluting and non-corrosive, the principal costs entailed in its use are production costs — han-

dling, storage, manpower and equipment — which are comparatively small.

The TRB researchers did not include economic comparisons of the widespread use of CMA and rock salt. The consensus was that the widespread use of CMA as a general replacement for salt is "unlikely and unwarranted." The use of CMA on a selective basis (e.g. corrosion-prone bridges or in environmentally sensitive areas) was judged to be a reasonable option. Even though no direct cost comparisons were made, information was developed that permits a direct comparison of most of the factors affecting the economics.

Using the data from the study, FHWA prepared the table below that demonstrates that deicer cost is the overriding factor precluding more widespread use of CMA. If the cost of producing CMA could be significantly reduced, federal highway administrators believe the an-

nual cost for its widespread use would be nearly equal to that of salt. Currently, the FHWA is initiating a large-scale effort to discover means for reducing CMA production costs. This research comes in view of generally favorable experiences with CMA, the increasingly stringent environmental regulations being promulgated, the public's increasing sensitivity to environmental and health matters and the sizeable investment already made in CMA by the federal highway administration.

The research effort, scheduled to begin in FY 1993, is supported by FHWA, Con Edison, the States (through pooled-fund activities) and the New York State Energy Research and Development Authority. *From the U.S. Department of Transportation Federal Highway Administration Research and Technology Transporter newsletter, July, 1992.*

### Economics of Using Salt Versus CMA

<u>Item</u>	<u>Annual Cost - in Billions</u>			
		<div>Salt</div>		<div>CMA</div>
Motor vehicle corrosion protection	1.990-3.900			
Bridge decks	0.125-0.325	}	2.100-4.400	0
Parking structures	0.075-0.175			
Motor vehicle corrosion damage	1.000-2.000			
Bridge nondeck components	0.125-0.325	}	1.225-2.425	0
Other highway components	0.100			
Roadside object	NA			NA
Underground objects	NA			NA
User costs	NA			NA
Deicer purchase	0.300			7.800 <sup>1,2</sup>
Storage, handling, manpower, equipment	0.250	}	0.550	0.500 <sup>3</sup>
Environmental Costs	NA			0
<b>Total</b>	<b>3.875-7.375</b>			<b>8.300</b>

NA - not available.

<sup>1</sup>CMA cost: \$650 per ton.

<sup>2</sup>CMA application rate: 1.2 times salt.

<sup>3</sup>Storage, handling, and manpower costs for CMA increased over salt because larger amounts are required for deicing.

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**Alaskan Transportation Technology Transfer Program**

**Planning, Design and Field Notes**



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**Editor's Note:** This issue of *Scrambled Disks and Fried Drives* features a guest article by Ken Springer from Bettles, Alaska, discussing his preference for selecting a computer system. Following that, Billy Connnor, our full-time author and Project Manager in DOT&PF's Construction Section, offers his perspective and refers you to previous articles. Each makes points they believe are valid based on their background and experience. Any other thoughts out there? Please write in.

By Ken Springer

Apple Macintosh, NeXT, IBM OS/2, and the ubiquitous MS-DOS.

Perhaps I should describe the system I own, if for no other reason than to try to assure the reader that I do have some working knowledge of computers. I am lucky enough to have the ability to use three of the systems in my home. They are the Macintosh, the Atari, and MS-DOS systems. For peripherals, I have a laser and a dot matrix printer, two hard drives, modem with fax capability, an AB size plotter, color and mono monitors, two external

floppy drives (one 3 1/2" and one 5 1/4"), a 10 meg floppy drive, and a hand scanner.

I also have emulators that enable me to run most of the DOS and Mac software available. (In other words, I do not own a Macintosh or MS-DOS computer.) I am not into the programming aspect of computing. I rather just use the computer.

So let's get back to the secret: the operating system. When you go to the store or read the ad in the paper, look for the operating system. I will guarantee that almost all of the sys-

## OPERATING SYSTEMS

So what is the secret to knowing you are truly looking at a different computer? The secret is in the operating system.

Every computer has an operating system. It is the set of instructions that tells the computer how to be a computer.

Without the operating system, the computer is nothing more than a very expensive paperweight. It has been my experience that most new buyers and some not-so-new users of computers do not know enough about the operating system to be able to tell one truly different computer from another.

There are probably fifteen to twenty different operating systems on the market, being called things like desktop computing systems to personal workstations, and ranging in price from a few hundred dollars to probably \$100,000. Realistically, there are only four, possibly six, different operating systems that the home user is going to consider buying. In no particular order, they are the Commodore Amiga, Atari,

## The World of Graphical User Interface

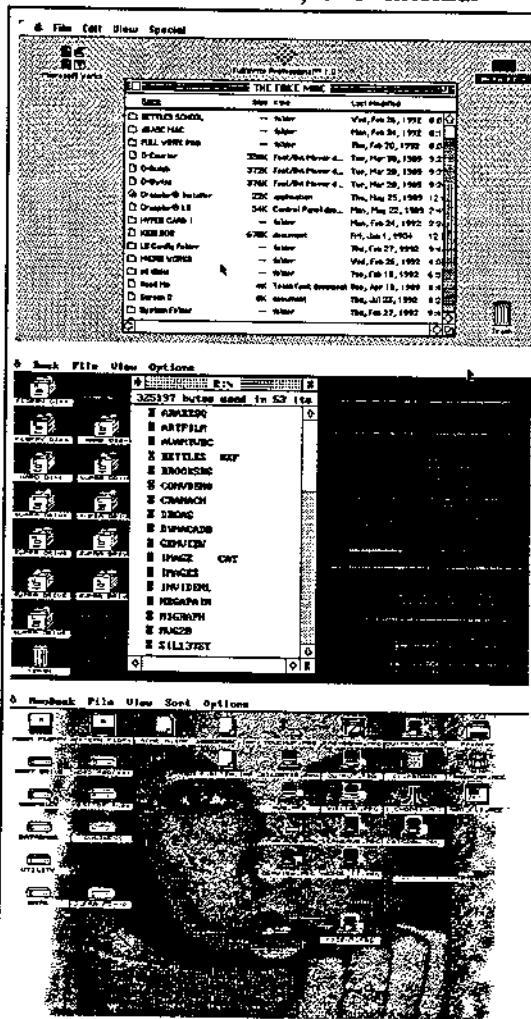
Here are three different looks to a Graphical User Interface (GUI).

The top view is how a Macintosh screen could look with one of the directory windows open. It has program icons installed on the desktop, and a different pattern has been installed.

The middle picture is a slightly modified Atari desktop. A caps/lock position indicator in the upper left corner, and a different screen font has been installed.

The bottom picture is a replacement desktop for the Atari, with a custom picture and custom icons on the desktop.

All three screenshots were taken from my computer.



**Alaskan Transportation Technology Transfer Program**

**Computer Notes**

tems will be MS-DOS based. It doesn't matter whether it is a genuine IBM, a Compaq, AST, Swan, Leading Edge, PC Brand, etc., if they have an MS-DOS operating system they are essentially the same machine. Only the paint, accessories, and luxuries are different. These machines are the "clones" of the original IBM operating system. None of the other operating systems have any "clones" to date that I am aware of. (The Australian clone of the Mac laptop still requires the owner to obtain genuine Apple "chips" to make it run.)

Since each operating system is different, each has its strengths and weaknesses, depending upon the design philosophy of the company.

For those of us who shop in Fairbanks, we are very lucky in that five of the six operating systems are available. The one that is not is the NeXT system. Despite being at the high end of the price scale, the NeXT system has the most native "horsepower" of the bunch.

Operating systems can be divided into two methods of interacting with the user: the command line interface (CLI) and the graphical user interface (GUI). The GUI is where most of the world is going. This is the system that the Mac made famous, and at long last even DOS is trying to catch up. The GUI is easier to learn, does not require that the user remember endless command variations, and is easier to use in general. Touch typists who "take" to the computer will probably find the CLI to be the preferred interface. All of the systems I am referring to use GUI interfaces as their "native" interface except DOS. The command line interface is the native interface for DOS, not Windows. The Windows GUI for DOS machines is extra work for the computer which slows the machine down. To get acceptable speed

from the Windows GUI interface requires a high powered DOS machine, where as, all levels of Ataris and Macintoshes use a GUI interface.

The three systems I know the least about are the Commodore Amiga, the IBM OS/2, and the NeXT. OS/2 is IBM's latest operating system. It appears to be very powerful, and is supposed to be superior to the Windows GUI. The Amiga and the NeXT have true multi-tasking operating systems. This means the computer can automatically accomplish two or more tasks at the same time automatically when the software is written to take advantage of this capability. The Amiga has wonderful built-in graphics capabilities, and an absolutely wonderful video manipulation program is available for it. If this is your area of interest, this may be the machine for you.

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#### APPLE MACINTOSH

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Using the MAC for serious work will definitely require a hard disk. This is because the operating system continually looks for pieces of the operating system as well as the program on the disk. If you are



using floppy disks only, you could find yourself doing quite a bit of disk swapping. This is because the operation system itself is quite large, and the original MAC did not have a large amount of memory. As

a result the designers had the computer retain in memory only the information necessary for the current operations.

For first-time users, the MAC will probably be the easiest to learn. I don't know how Apple did it, but any program that does not follow Apple's rules for how the interface is designed is almost doomed to failure. As a result, virtually every program has the print command in the same place, file management in the same place, font controls in the same place. It really makes learning it easier. Schools are fairly heavily invaded with Macs, so if your kids use one at school, this may be the logical choice.

Downsides of the MAC: usually both the software and hardware are more expensive. And if you get one of the low end machines, the screen is very small. From reading industry magazines, I have the impression that the machine crashes more than one would like, and that some programs are very picky about which version of the operating system you choose to run. But I doubt that these last two will be a problem to the average user.

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#### MS-DOS SYSTEMS

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DOS machines: I hate 'em. Even though they are the most popular, they are the hardest to set up. Automatic installation routines for different pieces of software can cause endless hours of frustration while you try to figure out what went wrong. Of course, it does provide consultants and authors a source of income telling you how to get out of the mess.

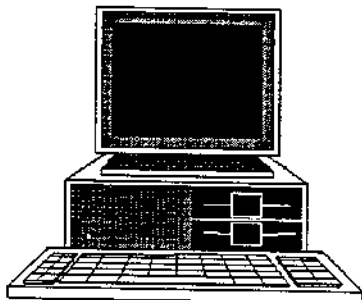
Before I typed this article, I spent an hour on the phone with the secretary at work resolving just this type of problem. The install program from a piece of software she

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was installing had thrown away the original CONFIG.SYS and partitions D: and E: were no longer accessible. And there are the problems of different video boards, hard drives, etc., that may not be supported by the software programs that you may buy.



As opposed to Apple, a severe lack of standards for the DOS machines exist as to how programs should interact with the user. As a result, about the only way to get similarity in program operation is to buy all the programs from one manufacturer, but there is no guarantee that the similarity will remain. Different versions of Word Perfect Corporation programs are good examples of this.

Since they are the most numerous, the greatest variety of software exists for these platforms. You can find a program somewhere that will do virtually anything you may want, no matter how off-the-wall it may be. After you will find absolutely no difference in the ability of the programs, just a difference in the colors and how the screen is laid out for data display and input.

If you are a novice to the computing world, or fairly inexperienced, the only good reason I can think of for buying a DOS machine is if you are involved in an area where the type of software program you need only exists on the DOS platform. Another reason might be you absolutely need compatibility with another DOS machine somewhere.

If you are worried about taking the case apart, or don't want to have to pay someone to do it, I wouldn't recommend this platform. The Mac and Atari sport much more of a "plug it in and play" approach. If you decide to go the DOS route, please read the fine print. Even though the advertised price is cheap, by the time you get everything you may need, you may be spending more money here than with another platform.

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## ATARI SYSTEMS

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The Atari system is my personal choice. It seems to have made the attempt at getting the best of both the DOS world and the MAC world. Overall, the hardware and software seem to be lower priced for the same capabilities. Its major strengths are desktop publishing and Musical Instrument Digital Interface (MIDI). There are desktop publishing programs available for the Atari that equal or exceed MAC



and DOS programs. As for music, the platform is far and away the professional musician's favorite. The soundtrack to "Born on the 4th of July" was done with an Atari.

Downsides for the Atari: It can be difficult to find dealers and software. I have noticed very few complaints about the stability of the hardware, and most of the complaints are about the company itself, not the hardware.

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## THINK BEFORE YOU SINK

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Before you sink mega dollars in a computer, make sure that you really need one! I loaned one of my computers to a friend, and it ended up just sitting around collecting dust.

The one thing he learned was that he really had no use for a computer. He ended up saving the money.

The majority of computer users buy the machine for word processing. Far and away, all of the machines will do more than a creditable job in that department.

Compatibility seems to be one of the big reasons for buying the same computer for home as at work. Well, there is compatibility, and there is compatibility. I carry a palmtop computer with me daily. The instructions say I can connect to any DOS computer with an IBM printer interface.

At work, the computer I use is billed as being IBM compatible, so I happily connected up to it. Could I make the computers "talk" to one another per the palmtop instructions?

No way. Seems the desktop I was using is not IBM compatible when it comes to the printer interface. I tried another one at work and things worked fine. But all my plans for the palmtop went up in smoke because my other computer doesn't directly talk to that machine.

The more you learn about the computer you choose, the less of a problem compatibility is. Just like becoming familiar with the new car with all the fancy options, the more time you invest in learning about the computer, the more productive and efficient you become. And unless you have the same platform, and the same software (right down to the version number), compatibility is somewhat dubious. The files that

created one word processor will not be compatible with a different word processor 99 percent of the time.

If I have accomplished anything with this article, I hope it is that you will have the desire to shop and learn before you buy. There are

many more differences between the systems than I have presented here. Do some serious study. Make your own decision. Don't let your friends or a salesman make it for you.

Just like building a house, the more time and effort you invest before buying a computer, the fewer mistakes you will find with your decision later. The decision you make here is one you will probably have to live with for some time.

### **Comments by Billy Connor**

These are some more or less random thoughts. While I don't necessarily disagree with the review of the operating systems, I do disagree with how hardware should be selected.

I strongly disagree that the operating system is the premise on which you buy a machine. If this were the case, I probably would consider a CPM or Unix machine because of their built in multi-tasking abilities. However, there is little software available.

Software is the key. Define the need then find the software to fill the need. Find the machine that runs it. Notice the machine is LAST. It really doesn't matter

whether the machine is a MAC, an Atari, a Commodore, a SUN workstation, or an IBM clone. In the final analysis, it is the software that allows the work to get done. Not the operating system. Not the Intel 486-SX or the Motorola 68000 chip. Not the Monitor or the hard drive. All of these things are used by the software.

While the machine may set limits on the software, it is the skill of the software developers that determines the success or failure of any machine or operation system.

Finally, the plug and play approach of the Apple world also sets limits. You are essentially stuck with what Apple wants to support. The IBM world offers the plug and play if the owner selects standardized hardware and software and strictly adheres to them. However,

the IBM world offers an open architecture which allows any vendor to offer equipment. That's both a blessing and a curse. Because there is such a wide range of hardware and software available, this freedom can result in incompatibilities. If you are not into computers, make sure you stay with the standards by which all others are judged. For example, if you want an HP Laser Jet III compatible, buy a Laser Jet III. Almost every problem I encountered is when someone wants to connect a less-known piece of hardware or when someone buys a machine that is at the bottom of the price list. If you don't like puzzles, buy a well-known brand. If you really want to plug and play in the IBM world, buy IBM equipment.

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Place a check by the publications you wish to borrow.

- ☐ **Assessment of the Needs of Alaska Residents Who are Disabled**, ID-863, Institute of Social and Economic Research, UAA, February 1, 1991, 300pp.
- ☐ **Best Practices in Specialized and Human Services**, ID-857, Transportation Coordination, U.S. Department of Transportation, July 1989.
- ☐ **Breakaway Timber Utility Pole Installations in Kentucky**, ID-852, USDOT/FHWA, FHWA-SA-91-003, January 1991, 20pp. This report describes the installation of ten breakaway timber utility poles.
- ☐ **COED: Corps of Engineers Editor**, ID-859, U.S. Corp of Engineers, Hydrologic Center, CPD-56, February 1987.
- ☐ **Considerations in Developing a Strategic Arterial Street System**, ID-875, TTI Research Report 1107-5F, SDOT/FHWA, November 1990, 62pp.
- ☐ **Coordinating Special Transportation Services in Louisiana**, ID-858, UMTA Technical Assistance Program, December 1988.
- ☐ **Evaluation of Improvements to Breakaway Cable Terminals**, ID-874, USDOT/FHWA-RD-91-065, June 1991, 74pp.
- ☐ **Flashing Beacons**, ID-842, USDOT/Northwest T2 Center, Brochure, 1pp.
- ☐ **Geographic Information Systems 1990**, ID-864, #1261 Highway and Facilities Design, Transportation Board, National Research Council, 68pp.
- ☐ **Geotextile Selection and Installation Manual for Rural Unpaved Roads**, ID-850, FHWA/USDOT, FHWA-RT-89-050, April 1989, 64pp. This serves as a guide for local officials in selecting and installing geotextiles on rural unpaved roads. Addresses most of the common conditions and situations present on rural roads.
- ☐ **HEC-1 Flood Hydrograph Package User's Manual**, ID-861, U.S. Army Corps of Engineers, Hydrologic Engineering Center, CPD-1A, September 1990.
- ☐ **HECDSS: User's Guide and Utility Program Manuals**, ID-860, U.S. Army Corps of Engineers, Hydrologic Engineering Center, July 1990.
- ☐ **Highway Liability - A Review of Work Zone Accident Cases**, ID-851, by Jack B. Humphreys, P.E., ITE Journal, April 1979, 4pp.
- ☐ **Highway Maintenance Operations and Research 1990**, ID-868, Transportation Research Board, National Research Council, #1268, 208pp.
- ☐ **Highway Research Abstracts**, ID-870, Volume 23, No. 2, Summer 1990, Transportation Research Board, National Research Council, 425pp.
- ☐ **Highway Research Abstracts**, ID-871, Volume 23, No. 3, Fall 1990, Transportation Research Board, National Research Council, 371pp.
- ☐ **IBC Median Barrier Demonstration**, ID-849, USDOT/FHWA, FHWA-SA-91-006, February 1991, Colorado Department of Highways, 29pp.
- ☐ **Marked Crosswalks**, ID-843, USDOT/NWT2 Center, Brochure, 1pp.
- ☐ **Paint Striping**, ID-844, USDOT/NWT2, Brochure, 1pp.
- ☐ **Pedestrian Signals**, ID-845, USDOT/NWT, Brochure, 1pp.
- ☐ **Performance of Asphalt Concrete Airport Pavements During Thaw Weakening Periods: A Field Study**, ID-873, CRREL Report 91-7, April 1991, 76pp.

***Alaskan Transportation Technology Transfer Program***

***Notes on Publications and Videos***

- \_\_\_ **Personnel and Cargo Transport in Antarctica, Analysis of Current U.S. Transport System**, ID-862, U.S. Army Corp of Engineers, CRREL Report 91-5, George Blaisdell, March 1991.
- \_\_\_ **Planning, Management and Economic Analysis 1990**, ID-869, Transportation Research Board, National Research Council, No. 1262, 180pp.
- \_\_\_ **Salt Storage**, ID-854, RP 2/85 Pamphlet, Also lists additional publications and audio visual materials available.
- \_\_\_ **The Salt Storage Handbook: A Practical Guide for Storing and Handling Deicing Salt**, ID-853, Salt Institute, 1986, 19pp.
- \_\_\_ **Securement of Wheelchairs and Other Mobility Aids on Transit Vehicles**, ID-856, U.S. Architectural and Trans. Barriers Compliance Bd. Project Action, September 1990.
- \_\_\_ **Stop and Yield Signs**, ID-846, USDOT/NWT2, Brochure, 1pp.
- \_\_\_ **Traffic Engineering Workshop**, ID-872, Ohio University, 1991. Includes regulations from MUTCD and covers record keeping, inventory and maintenance program, complaint forms and examples and funding sources.
- \_\_\_ **Traffic Flow, Capacity, Roadway Lighting and Urban Traffic Systems 1990**, ID-866, No. 1287 Transportation Research Board, National Research Council, 251pp.
- \_\_\_ **Transportation Management, HOV Systems, and Geometric Design and Effects 1990**, ID-867, Transportation Research Board, National Research Council, 236pp.
- \_\_\_ **Traffic Safety in Our Neighborhoods**, ID-848, USDOT/NWT2, Brochure, 1pp.
- \_\_\_ **Traffic Signals**, ID-847, USDOT/NWT2, Brochure, 1pp.
- \_\_\_ **Transportation Systems Planning and Applications 1990**, ID-865, Planning and Administration #1283 Transportation Board, National Research Council, 188pp.
- \_\_\_ **WordPerfect 5.0 for IBM PC's and Compatibles**, ID-841, Rob Krumm, MIS Press, 1988, 661pp.
- \_\_\_ **Work Zone Traffic Control and Tests of Delineation Material**, ID-855, Transportation Research Record #1230, Russell M. Lewis, Glossary of concepts, definitions and standard terminology currently used.

These publications may be borrowed for three weeks. However, if you need the materials longer, just contact our office for an extension. Questions? Contact Susan Earp at the Alaska Transportation Technology Transfer Program at (907) 451-5320.

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 Organization: \_\_\_\_\_  
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The Alaska Transportation Technology Transfer Program received no new videotapes since the last newsletter. This insert continues with new publications that have been received.

## NEW PUBLICATIONS AVAILABLE FOR LOAN

Place a check by the publications you wish to borrow.

- \_\_\_ **Alaska's Good Friday Earthquake: A Preliminary Geologic Evaluation**, ID-897, Geological Survey Circular 491, U.S. Department of the Interior, March 27, 1964, 35pp.
- \_\_\_ **Automated Transit Ridership Data Collection: Software Development and User's Manual**, ID-876, TTI:2-11-87-1087, September 1990, 37pp.
- \_\_\_ **A Case Study of Potential Causes of Frost Heave**, ID-886, CRREL Special Report 90-9, April 1990, 42pp.
- \_\_\_ **CCS HB220(efd del H)**, ID-885, Underground Storage Tanks, May 8, 1990, 27pp.
- \_\_\_ **CSSB 137(FIN): Relates to Commercial Drivers License**, ID-884, 1990, 6pp.
- \_\_\_ **Data Collection System for Pavement Condition Rating: Final Report**, ID-879, Ohio DOT - ATSI (Athens Technical Specialists, Inc.), March 18, 1991, 33pp.
- \_\_\_ **Design and Evaluation of Rigid and Flexible Pavements**, ID-896, TR Record #1286, TRB/NRC, 1990, 269pp.
- \_\_\_ **A Directory of Rural and Specialized Transit Operators**, ID-887, USDOT, June 1986. Includes the following:
  - Volume 1: Eastern U.S. Systems, DOT-I-86-26, 119pp.
  - Volume 2: Central U.S. Systems, DOT-I-86-27, 119pp.
  - Volume 3: Western U.S. Systems including Hawaii and Alaska, DOT-I-86-28, 119pp.
- \_\_\_ **Frost Action and Risk Assessment in Soil Mechanics**, ID-895, Transportation Research Record 809, TRB/National Academy of Sciences, 1981, 86pp.
- \_\_\_ **Grouting Silt and Sand At Low Temperatures: A Laboratory Investigation**, ID-902, CRREL Report 79-5, March 1979.
- \_\_\_ **Kansas Local Accidents Database (KSLAD) Version 1.0**, ID-890, User's Manual, January 1987, 42pp.
- \_\_\_ **Kansas Local Accidents Database (KSLAD) Version 1.10**, ID-891, User's Manual, November 1986, 38pp.
- \_\_\_ **Leachates: Terrain Analysis**, ID-307, Transportation Research Record 892, 82pp.
- \_\_\_ **Maintenance on High Volume Traffic Roads - Technology Transfer Workshop Proceedings**, ID-903, FHWA-TS-90-051, USDOT/FHWA, December 1990, 218pp.
- \_\_\_ **Microcomputer Program for Bridge Analysis and Ratings**, ID-893, New Mexico State University, October 1985, 169pp.
- \_\_\_ **Microcomputer Software for Geotechnical Engineering**, ID-889, TRB, 1989, 19pp.
- \_\_\_ **The National Highway Institute 1991 Course Catalog**, ID-880, NHI, USDOT/FHWA-HI-91-101, May 1991, 141pp.
- \_\_\_ **Pavement Evaluation and Rehabilitation**, ID-894, TRB/NRC, 1988, 317pp.
- \_\_\_ **Performance Measures for Rural Transit Operators**, ID-877, TTI Research Report 2008-1F, October 1990, 133pp.
- \_\_\_ **Safety of Multi-Unit Combination Vehicles: Report on Findings**, ID-882, The Scientex Corporation and R.D. Mingo and Associates, September 1990, 35pp.
- \_\_\_ **Sea Ice Strength**, ID-898, Geophysical Institute, University of Alaska, December 1966, 1473pp.



- \_\_\_\_\_ **Stabilization and Compaction**, ID-901, Transportation Research Record 690, TRB/National Academy of Sciences, December 1978, 37pp.
- \_\_\_\_\_ **Stabilization of Fine-grained Soil for Road and Airfield Construction**, ID-900, Special Report 86-21, U.S. Army Corps of Engineers, CRREL, July 1986, 37pp.
- \_\_\_\_\_ **TranSafety, Inc., Highway Safety Publications Catalog**, ID-881, April 1991, 47pp.
- \_\_\_\_\_ **Travel Impacts of Urban Freeway Reconstruction Projects In Texas**, ID-878, TTI:2-8-82/1-1108-3, Research Report 1108-3, September 1990, 119pp.
- \_\_\_\_\_ **Traverse Adjustment Computer Program: User's Manual**, ID-888, FHWA/USDOT, FHWA Bulletin, June 9, 1977, 3pp.
- \_\_\_\_\_ **Underground Storage Tanks - folder**, ID-883. Includes the following publications:
  - Dollars and Sense, EPA, December 1988, 15pp.
  - AKDEC Interim Guidance for Surface and Ground Water Cleanup Levels - Draft, June 20, 1990, 24pp.
  - ADEC Interim Cleanup Guidelines Flow Chart, Draft, July 26, 1990, 1pp.
  - Straight Talk on Tanks, Vapor Monitoring, 2pp.
  - Alaska's New UST Assistance Law HB220, AKDEC, 6pp.
  - Guidelines for Preparing Quality Assurance Project Plans, Revision #2, May 1989, 12pp.
- \_\_\_\_\_ **Use of Waste Sulfate for Remedial Treatment of Soils**, ID-899, FHWA-RD-76-144, Volume 11: Appendixes, Final Report, August 1976, 144pp.

These publications may be borrowed for three weeks. However, if you need the materials longer, just contact our office for an extension. Questions? Contact Susan Earp at the Alaska Transportation Technology Transfer Program at (907) 451-5320.

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**T2 CALENDAR OF EVENTS**

To publicize an event in our calendar, contact us at (907)451-5320.

OCTOBER						
S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
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25	26	27	28	29	30	31

 See Meetings Around Alaska.

 Training, see middle column.

DECEMBER						
S	M	T	W	T	F	S
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27	28	29	30	31		

Oct 3: IRWA Course 211-Written Communications, Contact Becky Iles, 456-2845.

Oct 5-9: Hazardous Waste/Substances, NHI #14229, Fairbanks, (907) 451-5322. \*\*

Oct 12-16: Hazardous Waste/Substances, NHI #14229, Anchorage, (907) 451-5322. \*\*

Oct 20-23: Citizen Participation by Objectives, Fairbanks, (907) 451-5323.

Oct 26-30: Traffic Engineering Short Course in Allied Fields, College Park, Maryland, (301) 405-2009.

Nov 3-5: NHI #14205 Project Development and Environmental Documentation, Fairbanks, (907) 451-5322.

Dec 4: Effective Partnering in Construction Contract Administration, Fairbanks, (513) 237-0112.

Dec 6-8: The Fifth Annual Conference & Road Show, Atlanta, Georgia, (404) 521-6630.

Dec 8-10: Second International Symposium on Railroad-Highway Grade Crossing Research and Safety, Knoxville, Tennessee, (615) 974-5255.

NOVEMBER						
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29	30					

\*\* FHWA and DOT&PF employees have 1st priority; other agencies and the private sector accepted on a space available basis.

JANUARY						
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**Meetings Around Alaska**

**Alaska Society of Civil Engineers - Anchorage:** Monthly, 3rd Tues., noon, Northern Lights Inn. **Fairbanks:** Monthly, 3rd Fri., noon, Captain Bartlett Inn. **Juneau:** Monthly, except June - August, 2nd Wed., noon, Breakwater Inn.

**Alaska Society of Professional Engineers - Fairbanks:** Monthly, 1st Fri., noon, Captain Bartlett Inn.

**Alaska Society of Professional Land Surveyors - Anchorage:** Monthly, 3rd Tues., noon, Executive Cafeteria Federal Building. **Fairbanks:** Monthly, 4th Tues., noon, Sunset Inn.

**Institute of Transportation Engineers - Anchorage:** Monthly, 3rd Thur., Elmers.

**International Right of Way Association - Anchorage:** Sourdough Chapter 49: Monthly, except July & December, 2nd Thur., noon, Anchorage International Inn. **Fairbanks:** Arctic Trails Chapter 71: Monthly, except December, 2nd Wed., noon, TBA. **Juneau:** Totem Chapter 59: Monthly, 1st Wed., noon, Mike's Place in Douglas.

**American Public Works Association:** September 24 and October 29, noon, Anchorage International Airport Inn, (907) 786-8109.

**International Conference of Building Officials - Fairbanks:** Alaska Northern Chapter: Monthly, 1st Wed., noon, Zach's, Sophie's Station, 459-6720.

**American Water Resources Association - Alaska Section, Northern Region:** Monthly, 3rd Wed., noon (Brown Bag Lunch), Room 531 Duckering, University of Alaska. Contact Larry Hinzman, 474-7331, for information.

## Who's Who in Alaska's Transportation Network

### Spotlight on Trent Macky, Service Area Engineer, Fairbanks North Star Borough

When Trent Mackey was a boy growing up in central New York, his dad, a veterinarian, would take him along on rural house calls. Young Mackey met and got along with many of the people his father served in the country. That experience helps him now in his job as the service area engineer in the Rural Services Division of the Fairbanks North Star Borough.

"A lot of the contractors I work with are a lot like the folks I used to meet with my dad," Mackey said. "They were great people."

Mackey now deals with over 300 volunteer commissioners in the service areas in the borough, along with between 35 and 40 contractors. His job responsibilities are to maintain a current register of roads in 96 road service areas, to serve as a liaison between the area commissioners and the contractors, to develop regular and special maintenance contracts for road service areas and to identify road hazards and safety problems and implement or coordinate corrective action.

The North Star Borough does not have road powers, but neighborhoods can petition the borough to establish a service area that can tax itself and receive state funding. Each area is governed by a board of commissioners elected from its members.

"I give the commissioners recommendations, but they call the contractors," he said. "We set up the maintenance contracts and provide engineering assistance for the roads. If the commissioner and contractor are having a conflict, I step in to try to settle it."

Another major part of Mackey's job is processing applications for new service areas.

"We have part-time help now with all the new applications," he said. "We'll also have to go out and verify all the miles for each new service area."

Basically, he is a very busy guy. Especially during snowstorms.

"I am the only engineer working here full-time," he said. "For 370 miles of roads in a snowstorm, this is the place people call."

What Mackey likes best about working in his office is getting to leave it.

"I like to go driving and look at the roads," he said. "I feel I can do my best work out in the field. I like to think I have a pretty good eye for safety problems."



Trent Mackey,  
Service Area Engineer, Rural Services,  
Fairbanks North Star Borough

When he sees something wrong or if something needs to be done, Mackey relays this information back to the commissioners, who make the decision whether to act or not.

"I think it's a tough job, you have to deal with so many people," he said.

However, Mackey manages to keep a positive attitude despite all the work.

"I think we are doing a real good job," he said. "We keep things running pretty smoothly."

Mackey, 41, was born and raised as the third child in a family of ten on a farm in central New York. He received an A.A.S. in engineering science from the State University of New York at Alfred in 1971. Two years later, Mackey graduated from the College of Environmental Science and Forestry

in Syracuse, N.Y. with a bachelor of science degree in forest engineering and another B.S. in forestry. In May, 1977, he received his B.S. in civil and environmental engineering with an emphasis in structural design from the Clarkson College of Technology in Potsdam, N.Y.

Arriving in Palmer, Alaska a year later, Mackey worked as a civil engineer for Bomhoff and Associates. There, he was involved in sewer, water, road design, preparation of contracts and was the project inspector on the Palmer airport runway.

From there, Mackey moved to a structural engineering position in Anchorage. He left the "hustle and bustle of Anchorage" in 1981 and found civil and structural engineering jobs in Fairbanks.

He started working for the North Star Borough in May, 1987 in the public works as an inspector, and then as project manager, working on capital improvement projects. In September, 1988, he went to work as a service area engineer for the Rural Services Division, where he remains today.

To get away from the hustle and bustle of work, Mackey plays tennis and basketball on competitive teams at the Fairbanks Athletic Club. He also enjoys playing with his two boys, Sam, 8, and Jacob, 3.

"The kids always keep you going, they're energetic with the new snow," he said. "There are a lot of forts around my house."

After he arrived in Fairbanks in 1981, Mackey and his wife, Christine, bought a 5.4 acre piece of land and went to work on a house, building it from the original trees on the lot. He and Christine, an RN in the pediatrics section of Fairbanks Memorial Hospital, are now living in the house, but Mackey is still working on it.

"I was told you don't ever finish," he said with a chuckle, "until you sell."